

DOCUMENT MICROFILMING IDENTIFICATION

G-1-30 SEPT 1976

GEOCRES No. 30M12-54

DIST. 6 REGION Central

W.P. No. 278-65-00

CONT. No. 77-46

W. O. No. _____

STR. SITE No. _____

HWY. No. 409

LOCATION Hwy. 409 & Dixon Rd.

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. 4

REMARKS: documents to be
unfolded before microfilming

REVISED FOUNDATION INVESTIGATION REPORT

For

Proposed Hwy. #409 Underpass at
Dixon Road, District #6, Toronto
W.O. 72-11018 -- W.P. 278-65

1. INTRODUCTION

Foundation investigations were requested by Mr. G.C.E. Burkhardt Regional Structural Planning Engineer, Central Region for several structures, proposed to be constructed in conjunction with the BELFIELD Expressway development. The memo containing the request was dated January 14, 1972. The proposed Hwy. #409 underpass at Dixon Road discussed herein is one of the projects in question.

Subsequent to the request a field investigation was carried out under the supervision of this Office. The boreholes were located and surveyed in the field by personnel of the Engineering Survey Office, Central Region. Presented in this report are the results of the investigations, together with recommendations concerning foundations.

2. DESCRIPTION OF THE SITE AND GEOLOGY

The proposed bridge site is situated at the existing level crossing of Airport Road and Elmbank Road, right in front of Toronto International Airport. The general area is relatively flat, occupied by industrial and commercial buildings.

Geologically the area belongs to the physiographic region known as the PEEL PLAIN. The characteristic surface feature of this plain is a gradual and fairly uniform slope towards Lake Ontario, across which deep valleys have been cut by several creeks and rivers. The underlying geological material of this plain is a till or boulder clay, containing large amount of PALAEOZOIC shale and limestone.

3. FIELD AND LABORATORY INVESTIGATIONS

The field work consisted of six sampled boreholes and five dynamic cone penetration tests adjacent to the boreholes. Boreholes were advanced using a Bombardier mounted hollow stem continuous flight auger. Bedrock was proved by drilling with an AXT size core barrel, equipped with a diamond bit. Undisturbed samples were taken in the borings at frequent intervals by means of a Split Spoon Sampler. The samplers were driven by a 140 lb. hammer, falling freely a distance of 30 inches, providing a driving energy of 350 ft./lb. The number of hammer blows necessary to advance the Split Spoon 12 inches into the soil is specified as penetration "N" value.

Soil samples were visually examined and classified upon recovery and again in the laboratory. Physical properties of the subsoil such as natural moisture contents, Atterberg Limits and grain size distributions were determined by laboratory testing. Field and laboratory test results are plotted on the accompanying borelog sheets, while the locations and elevations of the holes as well as stratigraphical cross sections are shown on Drawing #72-11018A in the Appendix.

4. SOIL CONDITIONS

4.1 Overburden

The overburden in every borehole was found to be a glacial deposit consisting of a heterogeneous mixture of clayey silt, sand and gravel. The depth of overburden is 57-62 feet, extending down to elevation 501 ft. - 509 ft. Within the uppermost 10 ft. or so, the consistency of the soils was observed to be stiff to hard. The "N" values within this depth range from 14 blows per ft. to 45 blows per ft. Below the surficial layer the deposit gradually becomes harder with depth. Beneath elevation 535 ft. "N" values are over 100 blows/ft. The natural moisture content ranges between

12% - 13% and the liquid limit varies from 18 to 22%. The natural moisture content lies below the plastic limits, indicating the overconsolidated nature of the deposit. Laboratory grain size analysis yielded the following ranges of distribution:

Sand	20 - 60%
Silt	25 - 58%
Clay	5 - 18%
Gravel	4 - 28%

Occasional sand seams were found in the lower portion of the deposit.

4.2 Bedrock

Bedrock was proved by diamond drilling in B.H. 6, located at the proposed west abutment. Due to the weathered and partially decomposed nature of the bedrock, the exact elevation of the rock surface was very difficult to establish precisely. It is estimated that at this location the rock surface lies at elevation 509 ft. - 510 ft. The bedrock was drilled for a distance of 12 ft. and the average recovery was only 10% - 20%. The bedrock was identified to be grey soft shale of the Dundas formation.

4.3 Groundwater Conditions

Groundwater was encountered in every borehole at relatively high elevations. The equilibrium waterlevels were established 4 - 15 ft. below groundsurface, corresponding to elevations 553 ft. - 560 ft.

5. DISCUSSION AND RECOMMENDATIONS

5.1 General

It is proposed to construct an underpass structure to carry Hwy. 409 under Dixon Road (Airport Road). The improved Dixon Road will have 6 lanes. The proposed structure is a 3 span bridge with

closed type abutments. The proposed grade of Hwy. #409 is at approximate elevation 543 ft., i.e., 20 - 22 ft. below existing ground level. The future grade of the widened Dixon Road is assumed to be approximately the same as the existing one.

The subsoil was found to be stiff to hard glacial till consisting of a heterogeneous mixture of clayey silt, sand and gravel. Shale bedrock was encountered at approximate elevation 510 ft.

5.2 Foundations

The proposed bridge may be supported on spread footings located within the glacial till deposits. An allowable load of 3.0 t.s.f. may be used for design purposes if the footings are placed at or above elevation 535 ft. Design loads may, however, be increased to 5.0 t.s.f. if the footings are placed below elevation 535 ft. A minimum cover of 4 ft. should be provided to the underside of the footing for frost protection purposes.

Excavations will extend well below the groundwater level. No major dewatering problems are foreseen due to the relatively impervious nature of the subsoil. It is believed that any minor seepage into the excavation could be handled by conventional pumping. In order to prevent the base of the excavation from softening, due to any minor seepage, a lean concrete working slab should be placed immediately after the completion of the footing excavation.

5.3 Earth Pressures

Closed type abutments should be designed to withstand the lateral earth pressures exerted by the retained soils. The stability of the abutments should also be checked for horizontal sliding along the footing base. In computing the resistance against sliding an adhesion values of 3000 p.s.f. may be used.

6. MISCELLANEOUS

The field work carried out during Feb. 14 - 18, 1972 was supervised by Mr. J. Bangs, Project Foundations Engineer. Equipment used was owned and operated by P.V.K. Drilling Co., Burford, Ontario. The report submitted on May 19, 1972 was written by Mr. A.K. Barsvary, Senior Foundations Engineer and reviewed by Mr. K.G. Selby, Supervising Foundations Engineer.

This revised report was prepared by Mr. A. Prakash, Senior Engineer.

A. Prakash

A. PRAKASH
Senior Engineer



M. Devata

M. DEVATA
Supervising Engineer

July 1975

DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS

ENGINEERING SERVICES BRANCH

RECORD OF BOREHOLE No. 1

FOUNDATION SECTION

JOB 72-11018

LOCATION Co-ords. 15, 873, 617N, 970, 148E

ORIGINATED BY J.B.

W.P. 278-65

BORING DATE Feb. 16 - 17/72

COMPILED BY J.B.

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger

CHECKED BY *HR*

SOIL PROFILE		SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT				LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w		BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS / FOOT		20	40	60	80	100	w_p		
563.4	Groundlevel												
0.0													
	GLACIAL TILL	1	SS	33	560								
	Heterogeneous	2	SS	50									
	mixture of clayey	3	SS	68									
	silt, sand and	4	SS	95									
	gravel.	5	SS	100	550								
	Stiff to Hard	6	SS	68									
	Brown and grey.	7	SS	81	540								
		8	SS	59									
		9	SS	100	530								
		10	SS	100	520								
		11	SS	100	510								
		12	SS	100									
		13	SS	100									
508.4													
55.0	End of borehole.												

DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS

DESIGN SERVICES BRANCH

JOB 2-11018

W.P. 278-65

DATUM Geodetic

RECORD OF BOREHOLE No. 2

FOUNDATION SECTION

LOCATION Co-ords. 15,873,623N., 970,038 E.

BORING DATE Feb. 17/72

BOREHOLE TYPE Hollow Stem Auger

ORIGINATED BY J.B.

COMPILED BY J.B.

CHECKED BY *W.R.*

SOIL PROFILE		SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE				LIQUID LIMIT ——— w_L			BULK DENSITY γ	REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		BLOWS / FOOT	BLOWS / FOOT				PLASTIC LIMIT ——— w_p				
						SHEAR STRENGTH P.S.F.				WATER CONTENT ——— w			WATER CONTENT %		
						○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB. VANE				w_p ——— w_L			10 20 30		
565.3	Groundlevel														
0.0	GLACIAL TILL		1	SS	42										
	Heterogeneous		2	SS	46	560								6 30 49 15	
	mixture of clayey		3	SS	67										
	silt, sand and		4	SS	82	∇									
	gravel.		5	SS	58										
	Stiff to Hard		6	SS	34	550								16 27 45 12	
	Brown and grey.		7	SS	78										
			8	SS	149	540									
			9	SS	100/3"										
529.3			10	SS	100/3"	530									
36.0	End of borehole														

DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS

DESIGN SERVICES BRANCH

RECORD OF BOREHOLE No. 3

FOUNDATION SECTION

JOB 11018

LOCATION Co-ords. 15,873,769 N., 970,123 E.

ORIGINATED BY J.B.

W.P. 278-65

BORING DATE Feb. 15-16/72

COMPILED BY J.B.

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger

 CHECKED BY *[Signature]*

SOIL PROFILE		SAMPLES		ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	NUMBER	TYPE		20	40	60	80	100	w_p	w	w_L		
563.8 0.0	Groundlevel													
	GLACIAL TILL	1	SS	58										
	Heterogeneous	2	SS	45										
	mixture of clayey	3	SS	71										
	silt, sand and	4	SS	70										
	gravel.	5	SS	38										
	Stiff to Hard	6	SS	39										
	Brown and grey.	7	SS	61										
		8	SS	40										
		9	SS	100/5"										
		10	SS	100/5"										
		11	SS	100/3"										
		12	SS	100/5"										
		13	SS	100/2"										
	sand	14	SS	100/3"										
		15	SS	100/3"										
501.8	Shale Fragments													
62.0	End of borehole.													

DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS

DESIGN SERVICES BRANCH

RECORD OF BOREHOLE No. 4

FOUNDATION SECTION

JOB 72-11018

LOCATION Co-ords. 15,873,797 N., 970,050 E.

ORIGINATED BY J.B.

W.P. 278-65

BORING DATE Feb. 14 - 15/72

COMPILED BY J.B.

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger.

CHECKED BY *[Signature]*

SOIL PROFILE		STRAT. PLOT	SAMPLES		ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT — w_L		PLASTIC LIMIT — w_p		BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION		NUMBER	TYPE		BLOWS / FOOT	SHEAR STRENGTH P.S.F.		WATER CONTENT — w				
							○ UNCONFINED ● QUICK TRIAXIAL	+ FIELD VANE x LAB. VANE	WATER CONTENT % 10 20 30				
564.1	Ground level.												
0.0													
	GLACIAL TILL		1	SS	14	560							
	Heterogeneous		2	SS	37								
	mixture of clayey		3	SS	66								
	silt, sand and		4	SS	141								9 26 49 16
	gravel.		5	SS	71	550							
	Stiff to Hard		6	SS	45								
	Brown and grey.		7	SS	62								
			8	SS	50	540							
			9	SS	100/3"								8 38 44 10
			10	SS	100/4"	530							
			11	SS	100/4"								
			12	SS	100/4"	520							
514.2													
49.9	End of borehole.												

DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS

DESIGN SERVICES BRANCH

RECORD OF BOREHOLE No. 5

FOUNDATION SECTION

JOB 11018

LOCATION Co-ords. 15,873,820 N., 969,956 E.

ORIGINATED BY J.B.

W.P. 278-65

BORING DATE Feb. 11/72

COMPILED BY J.B.

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger

CHECKED BY

SOIL PROFILE		SAMPLE ^c			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT		LIQUID LIMIT ——— w_L PLASTIC LIMIT ——— w_p WATER CONTENT ——— w		BULK DENSITY γ	REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		20	40	60	80			100
564.7	Groundlevel.											
0.0												
	GLACIAL TILL		1	SS	12							
	Heterogeneous		2	SS	18							
	mixture of clayey		3	SS	39							
	silt, sand and		4	SS	78							
	gravel.		5	SS	56							
	Stiff to Hard		6	SS	61							
	Brown and grey.		7	SS	56							
			8	SS	57							
			9	SS	100/5"							
	sand & gr.		10	SS	100/4"							
			11	SS	100/2"							
			12	SS	100/2"							
516.7												
48.0	End of borehole.											

DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS

DESIGN SERVICES BRANCH

JOINT -11018

LOCATION: Co-ords. 15,873,716 N., 969,918 E.

ORIGINATED BY J.B.

W.P. 278-65

BORING DATE Feb. 17 - 18/72

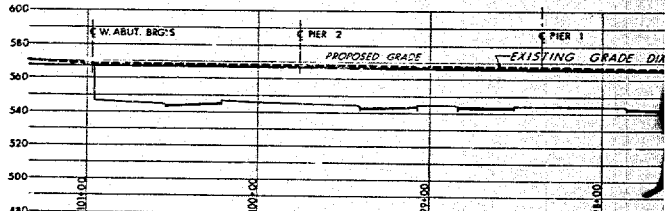
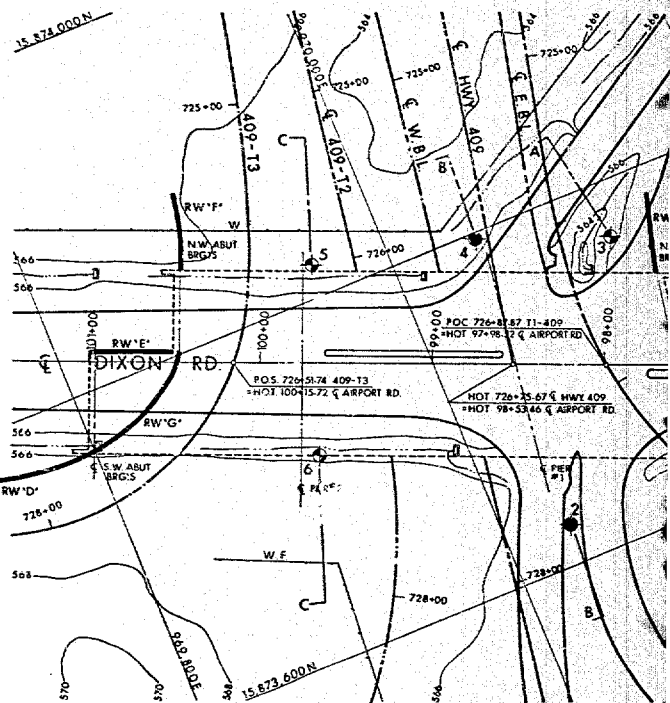
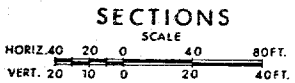
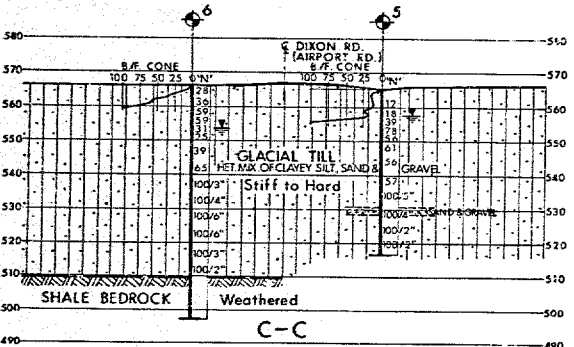
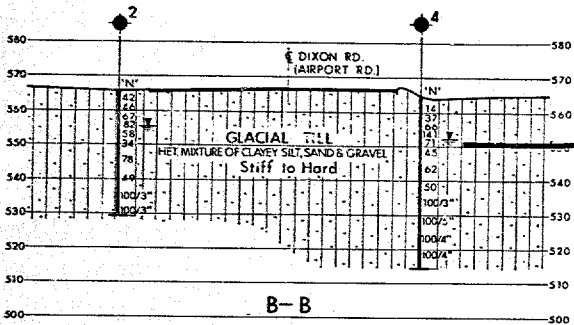
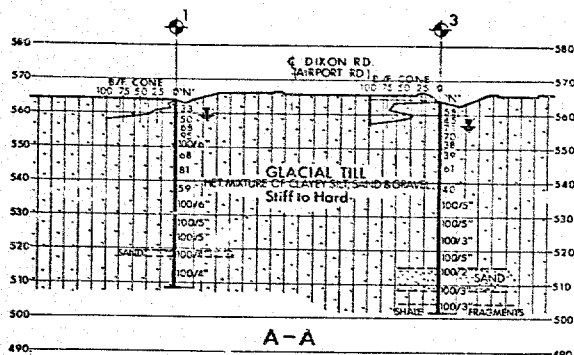
COMPILED BY J.B.

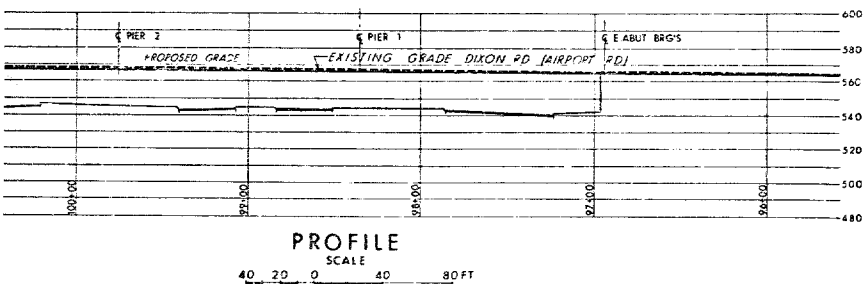
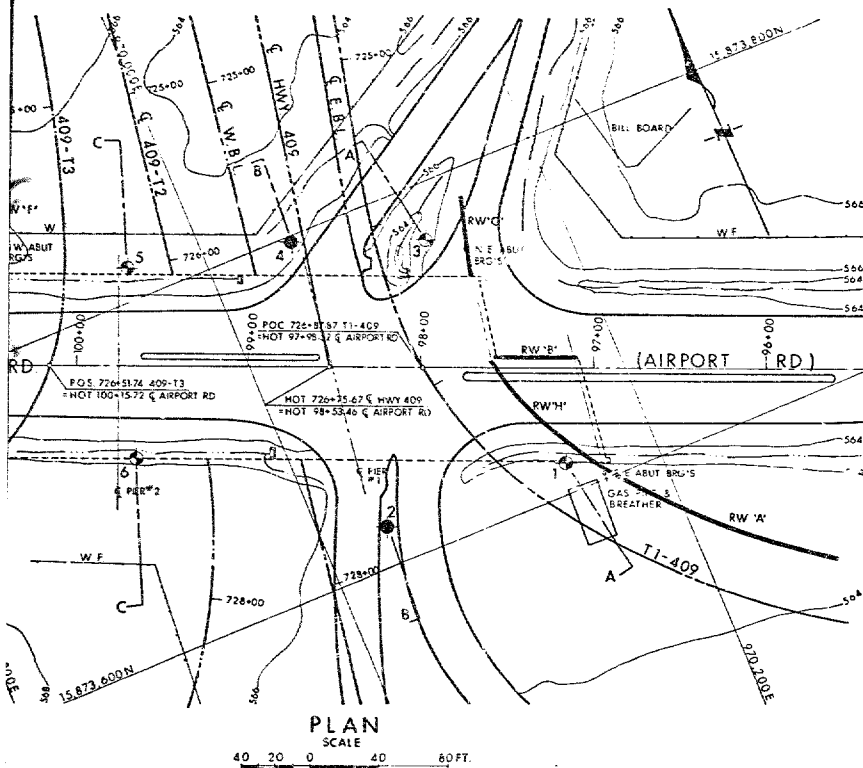
DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger

CHECKED BY

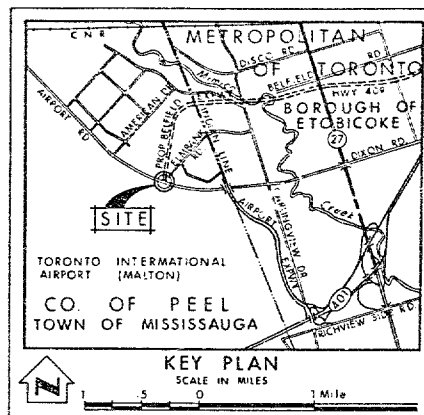
SOIL PROFILE		SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT — w _L PLASTIC LIMIT — w _P WATER CONTENT — w		BULK DENSITY Y P.C.F.	REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		BLOWS / FOOT	20	40	60			80
566.7	Groundlevel.											
0.0												
	GLACIAL TILL		1	SS		28						
	Heterogeneous		2	SS		35						
	mixture of clayey		3	SS		59						
	silt, sand and		4	SS		59						
	gravel.		5	SS		31						
	Stiff to Hard		6	SS		25						
	Brown and grey		7	SS		39						
			8	SS		65						
			9	SS		100/3"						
			10	SS		100/4"						
			11	SS		100/6"						
			12	SS		100/6"						
			13	SS		100/3"						
			14	SS		100/2"						
49.7			15	RC		75%						
57.0	Grey weathered shale		16	RC		20%						
	bedrock.		17	RC		20%						
			18	RC		10%						
97.2			19	RC		0%						
59.5	End of borehole.											





NOTE: FOR CONTRACT DOCUMENT

The complete foundation investigation report for this structure may be examined at the Structural Office and Foundation Office, Downsview, and at the TORONTO District Office.



LEGEND

- Bore Hole
- ⊕ Cone Penetration Test
- ⊕ Bore Hole & Cone Test
- ⊕ Water Levels established at time of field investigation Feb. 1972

NO.	ELEVATION	CO-ORDINATES	
		NORTH	EAST
1	563.4	15,873,617	970,148
2	565.3	15,873,623	970,038
3	563.8	15,873,769	970,123
4	564.1	15,873,797	970,050
5	54.7	15,873,820	969,956
6	566.7	15,873,716	969,918

— NOTE —

The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence and may be subject to considerable error.

REVISIONS	DATE	BY	DESCRIPTION
July 75	S.O.		SUB-SOIL DESCRIPTION REVISED
Feb 74	G.F.		SPICES LOCATION CHANGED ON PLAN

MINISTRY OF TRANSPORTATION & COMMUNICATIONS DESIGN SERVICES BRANCH — FOUNDATIONS OFFICE

DIXON ROAD (AIRPORT RD.)

HIGHWAY NO. Prop. 409 DIST. NO. 6
CO. PEEL TOWN OF MISSISSAUGA
TWP. _____ LOT _____ CON _____

BORE HOLE LOCATIONS & SOIL STRATA

SUBMD A B	CHECKED <input checked="" type="checkbox"/>	WP NO 278-05	DRAWING NO
DRAWN <input checked="" type="checkbox"/>	CHECKED <input checked="" type="checkbox"/>	JOB NO 72-11018	72-11018A
DATE <u>Mar 5 1972</u>		SITE NO <u>24-310</u>	BRIDGE DRAWING NO
APPROVED <u>[Signature]</u>		CONT NO	24-310-2

DOCKMAN MOUNTAIN IDENTIFICATION

GEOCRES No. 30 H12 - S4

DIST 6 REGION CENTRAL

W.P. No. 278 - 65 - 00

CONT. No. 77- 46

W. O. No. _____

STR. SITE No. _____

HWY. No. 409

LOCATION HWY 409 AND

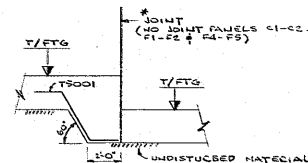
DIXON RD.

OVERLAY IN THIS REPORT BE IDENTIFIED WITH THIS REPORT 4

REMARKS _____

PANEL DESCRIPTION			DATA AT STATIONS				SECTION DIMENSIONS AT STATIONS				REINFORCING STEEL FOR PANEL																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
PAN. NO.	PANEL LENGTH	SECT. TYPE	STATION	ELEVATIONS		PANELS	YF TYPE	C	E	A	D	H	YF	YG	YM	F	G	20#										#4 @ 16"				SHEAR KEY				CURB	#SHEET	V																																																																																																																																																																																																																																																																																																																																																																																																																																											
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E1	33'-09"	CUT	100+56.00 100+59.11	538.0 538.0	548.12 548.11	30'-2 1/8" 30'-2 1/8"	EXP EXP	3'-7 1/8" 3'-10 3/8"	1'-5 1/8" 1'-3 1/8"	10'-10" 10'-10"	4'-1 1/8" 4'-1 1/8"	3'-0" 3'-0"	1'-0" 1'-0"	10'-0" 10'-0"	7'-0" 7'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 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10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"	10'-0" 10'-0"

NOTE: PANEL F3 12" & REDUCED SEWER TO BE RELEASED IN 2' OF STYCOFOAM.



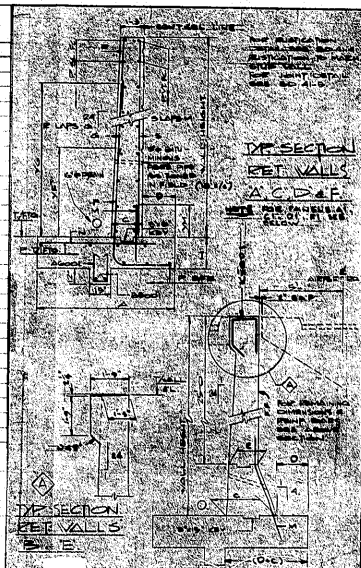
NOTE: SIDES & BOTTOM OF ALL FOOTINGS CAST AGAINST UNDISTURBED MATERIAL.

NOTES

1. REINFORCING BARS TO START & FINISH 5' FROM JOINTS OR ENDS OF WALL.
2. HORIZONTAL STEEL IS NOT CONTINUOUS THROUGH EXPANSION & CONTRACTION JOINTS.
3. REINFORCING BARS TO HAVE MIN. 12" LAP WITH 5 BAR.
4. FOR LOCATION OF REINFORCING BARS, SEE ELEVATIONS.
5. FOOTINGS TO BE POURED AGAINST UNDISTURBED GROUND.
6. FOR ARCHITECTURAL DETAILS, SEE DWG. D.
7. CLASS OF CONCRETE 4000 PSI.

DATE	BY	REVISION
		30M12-54
DEPARTMENT OF HIGHWAYS ONTARIO		
HWY 409 UPASS AT AIRPORT RD		
KING'S HIGHWAY No. 409		
DES. P.E.L.	LOT	CON.
TIME MISSISSAUGA		
RET. WALLS A, B, C, D, E, F (H)		
APPROVED	BY	DATE
DESIGN	CHECK	DATE
DRAWING	CHECK	DATE
DATE	SECT 14	100000 MS 50-4

PANEL DESCRIPTION			DATA AT STATIONS				SECTION DIMENSIONS AT STATIONS				REINFORCING STEEL FOR PANEL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
PANEL NO.	PANEL LENGTH	PANEL TYPE	STATION	ELEVATIONS			PANELS	JF TYPE	C	E	A	D	H	SECT. 1	YF	YG	YM	F	G	2 16"				#5				#5 2 16"				N	P	#5 2 16"				SHEAR KEY				CUB	T	V																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
				17.11	17.11	17.11														17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11			17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11				17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11	17.11



NOTES

1. S.S.M. AT BARS TO START & FINISH 5' FROM JOINTS OR END OF WALL.

2. HORIZONTAL STEEL IS NOT CONTINUOUS THROUGH JOINTS OR CONSTRUCTION JOINTS.

3. 1" TO HAVE MIN. 1" LAR WITH 6" BAR.

4. FOR LOCATION OF BARRETT RAIL SEE ELEVATIONS.

5. FOOTINGS TO BE SHOWN ALONG UNFINISHED GRADE FOR APPROXIMATE TOTAL SEE SHEET 10.

6. CLASS OF CONCRETE 3000 PSI.

DEPARTMENT OF HIGHWAYS ONTARIO		BRIDGE DIVISION	
Hwy. 409 UPASS AT AIRPORT RD.			
NO. 409		DIST. No. 6	
NO. 409		CON.	
RET. WALLS A, B, C, D, E, F (1)			
APPROVED		DESIGNED	
DRAWING		CHECK	
DATE		REVISION	

